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CELLULAR RADIO SYSTEM COMPRISING RADIO RECEIVER

The user of a radio receiver for broadcast of information signals, such as radio programs or television programs, must himself control the apparatus, in the sense that he must regulate it on the frequency of the local sender of the program broadcast network as soon as it is selected and furthermore place it under tension when the start time of a program arrives which interests him.

In the example of a mobile receiver of radio programs, integrated into the dashboard of a vehicle or carried by its user, it can happen that the latter has to change the reception frequency of the receiver each time he enters the radio zone of a new sender. He therefore has to obtain frequency tables of various stations or broadcast networks, which is a constraint and can endanger this user if he is busy driving. It can also happen that the user forgets to activate his radio receiver at the right time.

The aim of the present invention is to alleger la task of managing reception of the signals broadcast by radio and to offer novel promotion means to the broadcasting operators.

To this end, the invention relates to a cellular radio system comprising radio broadcast reception means, telephone reception means, which comprise means for receiving data, and means controlled by the means for receiving data for controlling the radio broadcast reception means.

A radio broadcast radio receiver and telephone means which receive, over the telephone network, remote control data from the radio receiver, which all the more lightens the task of the user are thus combined functionally.

The invention will be better understood by means of the following description of a preferred embodiment of the cellular telephone system of the invention, with reference to the sole figure which schematically illustrates this system as well as a radio broadcast station, interconnected by a radio broadcast network and by a telephone network, here the GSM network.

The apparatus designated by 1 is a terminal, in this case mobile and portable, which comprises a receiver 20 of information broadcast by a radio broadcast network 3 and further comprises the telephony circuits of a GSM cellular telephone handset, capable of being linked to the GSM 2 network.

The broadcast information originates from a station 4 for production of radio programs connected in output, here by a cable, to a head of network station (not shown) of the

broadcast network 3 for controlling its sender and repeaters, or resenders, which cover an extensive territory including the GSM 2 network.

The terminal 1 comprises a time base 10 timing the functioning of a central microprocessor unit 11 connected to the entirety of the various circuits of terminal 1, to manage it. A keyboard 12 and a display 13 are connected to the central unit 11, as is a microphone 14 and a loud-speaker 15, the latter via contact of a two-position relay 16 controlled by the central unit 11. The central unit 11 is connected to the GSM 2 network by a radio circuit 17, which ensures inter alia the packeting of numerical data of vocal signal for sending, and converts the vocal signal packets received in a flow of data to return it by the loud-speaker 15 after numerical/analog conversion in the central unit 11. Associated with the latter is a block 18 for reception of data for managing the short message service of the GSM 2 network, the block 18 capable of receiving and managing short messages capable of selectively being of point-to-point, SMS, or common broadcast type in a cell (SMS-CB). It is recalled that this service transmits data packets, between subscribers of the GSM 2 network, or from an external source to the GSM network, for example from a terminal of the protected trade mark Minitel via a dedicated server or electronically via the Internet via a specialised platform. This transmission is carried out across signal or data channels and is done automatically, without the terminal GSM called having to respond to the call.

The radio receiver 20, connected at input to the broadcast network 3, comprises, highly schematically, an input amplifier stage 21 followed by a frequency transposition mixer stage 23 controlled by a local oscillator of a reception

frequency regulating circuit 22 whereof a control input is connected to an output of the central unit 11. The output of the mixer 23 is applied to a circuit 24 which performs pass-band filtering, amplification and output impedance adaptation, to present low impedance substantially equal to that of the loud-speaker 15. The vane of the relay 16 pivots about an axis connected electrically to the loud-speaker 15, in one position, to connect the latter to the central unit 11, and thus to the radio circuit 17, and, in the other position, to connect the loud-speaker 15 to the output of the circuit 24. The receiver 20 further comprises a circuit 25 for reception and execution of orders from the central unit 11, connected to an output of the latter. The circuit 22 represents a particular case of circuit 25, for frequency regulating orders.

The station 4, apart from production of radio programs and sending them over the broadcast network 3 via circuits 41, also ensures a SMS short message service, over the GSM 2 network. For sending SMS messages point-to-point, the station 4 is connected to radio circuits 42 which are the equivalent of a GSM handset and allow sending of SMS point-to-point. For a data link, corresponding to a general case, for example a specialised link or a link via the Internet, the radio circuits 42 further allow transmission of SMS-CB broadcast messages by way of the SMS-CB service of the GSM 2 network. The circuits 42 are further connected to circuits 43 for managing equipment such as the terminal 1.

The operation of the networks 2, 3, the terminal 1 and the station 4 and external sources will now be explained.

In the radio receiver part 20 of the terminal 1 the oscillator circuit 22 and the circuit 25 constitute receivers remote controls from the station 4, sent out in SMS short messages over the GSM 2 network, via the administration circuits 43 across the radio transmission circuits 42, destined for terminal 1 (in practice to a plurality of such terminals). The radio circuit 17 which receives it and retransmits it, in this case via the central unit 11, to the administration circuit SMS 18, which puts the remote-control signals of the SMS message received in the desired form for transmitting to the circuits 22, 25. The radio circuit 17 functions in this phase of telecontrol as a radio receiver for data in the form of SMS short messages and in fact forms a single functional entity with the reception block 18. The reception block 18 then controls the central unit 11 so that it transmits the remote-controlled signals to the circuits 22 and 25 and thus controls the latter.

SMS messages are sent by station 4 destined for terminals such as that designated as 1 to indicate, in each zone covered by a specific resender of the broadcast network 3, the frequency of the resender in question. When the telecontrols are connected to considering the geographic position of the terminal 1, for example to regulate the frequency of the receiver 20, the terminal 1 can provide its position to the control circuits 43. The terminal 1 can also recognise, by its position, which commands it must consider in the flow of data received via SMS. As the GSM 2 network itself ensures tracking of the shifts of terminal 1, it can be provided that this is an operating centre of the GSM 2 network which supplies this information to circuits 43, or to the GSM network itself when it sends the SMS, so that the latter automatically triggers sending the appropriate telecontrols. When the terminal 1

enters a new resender zone, its local oscillator 22 is telecontrolled by an SMS message, initialised by station 4, to be tuned to the frequency of the resender in question, supplied in the form of data in the SMS message. As mentioned above, the control circuit 18 here ensures adaptation of the frequency data received in the SMS message to convert it to an appropriate numerical value, if the oscillator of the circuit 22 is programmable, or to an analog value of oscillator control of the circuit 22 if it is a VCO (voltage controlled oscillator).

The circuit 25 can likewise receive telecommands originating from the station 4, or from external sources via the GSM 2 network, in the form of SMS short messages across the circuits 17, 11, 18. The circuit 25 can for example receive a control for putting into operation, or activation, (or else deactivation) of the receiver 20 and then control a supply interrupter of the latter. As a variant, the circuit 25 or the central unit 11 can simply warn the user of the arrival of an SMS message by a sound from the loud-speaker 15 or by displaying a warning message on the display 13 on which can also be displayed the SMS message received. In a similar case, the user is in the telecontrol chain going from the source of the SMS to the controlled receiver element 20.

In practice, the user of the terminal 1 will have previously telephoned the station 4 or warned the external source to request that it execute such a telecontrol action, that is, that it will have memorised in the control circuits 43, or equivalent external circuits, a list of selected programs whereof the broadcast is provided, defined by their name or by their date and start and finish time. Such a request, made from the keyboard 12, can be transmitted

automatically via SMS short message, from the radio circuit 17 of terminal 1 to circuits 43 of the station 4 or to external sources, thus via simple data transmission and without having to resort to an operator. The circuits 43 or the equivalent circuits then compare the current time to that of the start of the first of the selected programs and send the desired telecontrol a few minutes prior to the program start time.

For adaptation of telecontrol data received, in the central unit 11 of the terminal 1 a data memory 19 is provided addressed by the reception block 18 by means of SMS data originating from the circuit 17, the memory 19 constituting a transcoding table providing the value of the frequency of a resender of network 3 from data designating this resender, as its name, its geographic position, sent by the source of the SMS. The memory 19 in fact contains the frequency plans of the senders and resenders of a plurality of radio stations.

The terminal 1 can also be provided to receive information other than radio or even television programs, for example data relative to traffic in the zone where it is located.

CLAIMS

1. A cellular telephone system comprising radio broadcast reception means (20), (17, 18) telephone reception means, which comprise data reception means (18), and means (11) controlled by the means for receiving data (18) to control the radio broadcast reception means (20).

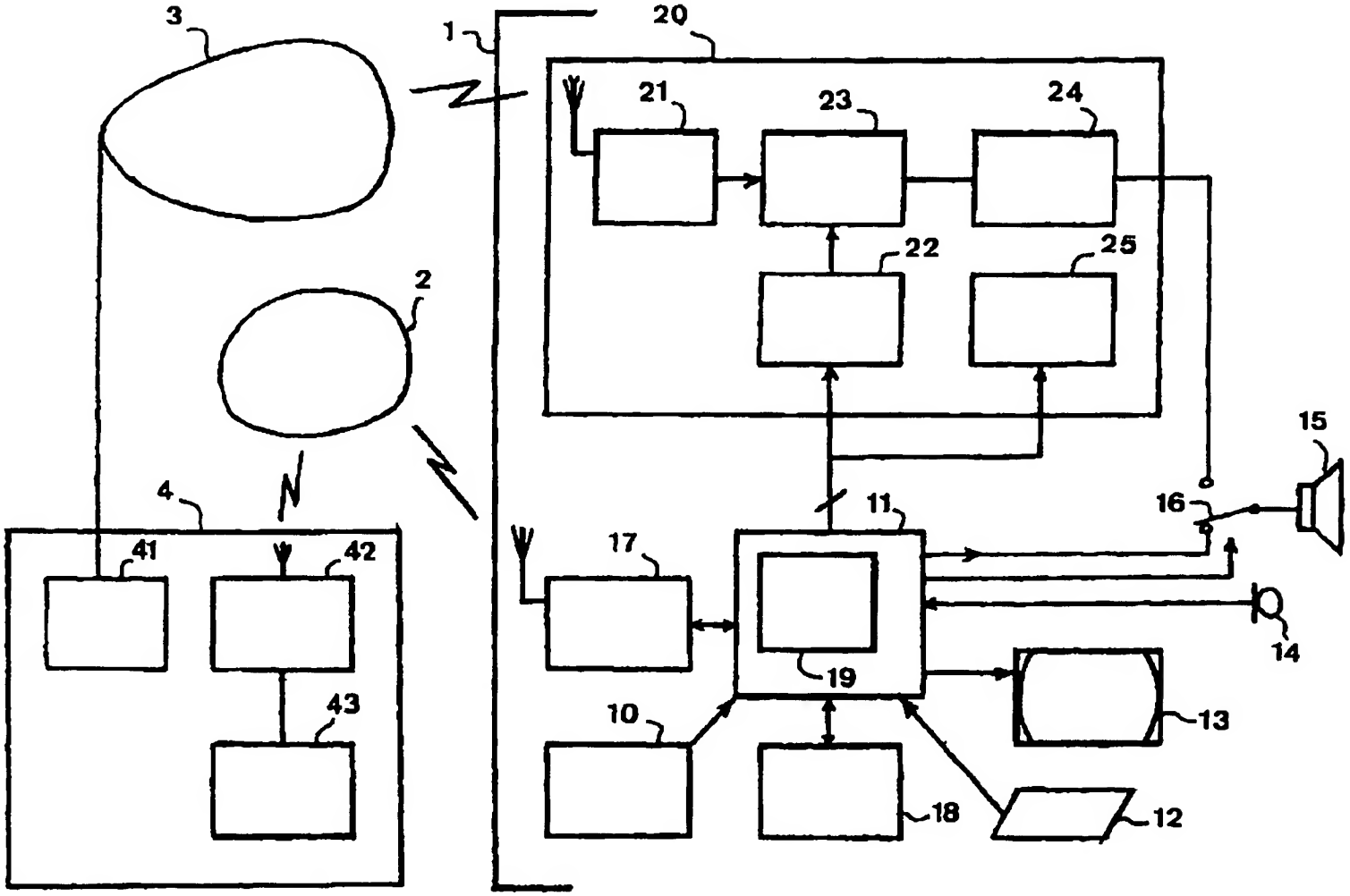
2. The system as claimed in Claim 1, wherein a data memory (19) is provided designed to be addressed by the means for receiving data (18) and to control said control means (11) of the radio broadcast reception means (20).

3. The system as claimed in any one of claims 1 and 2, wherein the means for receiving data (18) are designed to control the frequency of the radio broadcast reception means (20).

4. The system as claimed in any one of claims 1 to 3, wherein the means for receiving data (18) are designed to control putting the radio broadcast reception means (20) into operation.

5. The system as claimed in any one of claims 1 to 4, wherein the means for receiving data (18) are service means for receiving SMS short messages.

6. The system as claimed in Claim 5, wherein the means for receiving data (18) are designed to receive short messages broadcast by cell (SMS-CB).



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